Ghana: energy policy.

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GHANA: ENERGY POLICY

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General Information on Ghana

Ghana[1] is a lower middle-income country located in West Africa. It shares boundaries with Burkina Faso to the North, the Atlantic Ocean to the South, Togo to the East and Cote d'Ivoire to the West. It has a total land area of approximately 238 540 square kilometres, and is demarcated into 10 administrative regions. Ghana's estimated population is 27,341,565 made up of 50.9 percent male and 49.1 percent female, with a 1.82 percent increase in the population compared to the previous year in 2015 (Countrymetres 2016). Forty percent of the population are 15 years and below while the elderly population (65 years and above) accounts for 4.7 percent of the total population (Ghana Statistical Service 2013, p. 64). Since 1960, the population of Ghana has more than tripled, and this has implications for energy supply and consumption.

As a thriving multi-party democratic state underpinned by a Constitution,[2] it has a functional government, a vibrant legislature and a reasonably independent judiciary. Ghana's image as a stable democracy, in a region noted for political instability, coupled with an attractive investment climate has made it one of the preferred investment destinations in West Africa. With a real GDP per capita estimated at US$3,864, Ghana ranks 140th out of the 188 countries on the UNDP Human Development Index[3] (UNDP 2015, p. 248). The country's economy is largely based on natural resource extraction, forestry and agriculture but in recent years, it has also witnessed strong growth in the service sector especially in the area of telecommunication. After years of intermittent exploration and prospecting, 600 million barrels of light oil were discovered offshore in the West Cape Block in Ghana in 2007, sparking a flurry of exploration activity. In December 2010, Ghana joined the community of oil-producing countries with the commissioning of the Jubilee Oil Field operations. Intensive petroleum exploration and production activities coupled with other economic activities in the past decade led to significant economic growth in Ghana. This growth pattern has slowed since 2013 due to economic relapse attributable mainly to factors such as unreliable power supply, weak manufacturing and high inflation.

Energy Mix of Ghana

The main energy sources in Ghana are biomass, electricity and fossil fuels. Biomass or wood fuel constitutes the primary source of energy in Ghana constituting about 65.6 percent of energy consumption in the country. The main components of this source of energy are charcoal, firewood and other wood products such as sawdust and sawmill residue. Many households and small businesses in the informal sector of the economy rely on this source of energy for residential and commercial use. Activities such as baking, fish smoking, traditional soap making, brewing and textile manufacturing by these small enterprises depend almost entirely on the availability of biomass (Energy Commission 2006). Fossil fuels (petroleum products) constitute 26 percent of total energy consumption in the country and represent an important source of energy for the transport, aviation and manufacturing sectors of the economy. Its main components include aviation fuel, petrol (gasoline), DPK (Kerosene), Gasoil and Liquefied Petroleum Gas (LPG). Ghana is a net importer of crude oil and other refined petroleum products and is often exposed to the instabilities of the international oil market.

The other major source of energy is electricity. Since 1965, Ghana's main source of electricity was hydro until the construction of the first thermal plant in 1998. There was a sharp drop in the hydro share of electricity from 91.5 percent in 2000 to about 66 percent in 2003, largely due to unfavourable climatic conditions which affected water flow in the Volta River, the main

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[1]Formerly known as the Gold Coast.

[2]The Constitution of the Republic of Ghana, 1992

[3] Based on national income and composition of resources.

water source (Energy Commission 2006). Since then, there has been a gradual decline of the hydro share of electricity and a corresponding increase in the volume of electricity generated from thermal sources. In the 2016 National Budget and Economic Policy Statement, there are clear indications of the current government's intentions to expand thermal generation with the installation of three thermal facilities with total production capacity of about 700MW and expansion of existing capacity (p. 15). Table 1 (below) provides details of current installed electricity generation capacity.

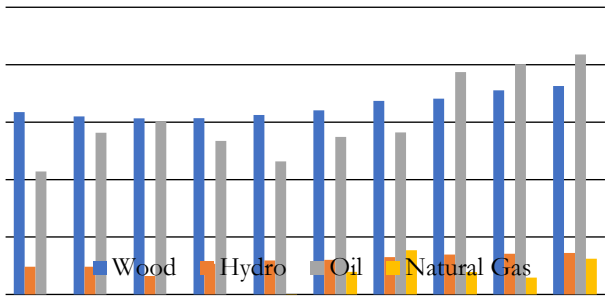
Table 1: Installed Electricity generation capacity as of 2014

PLANT	FUEL TYPE	INSTALLED CAPACITY	SHARE (%)
Hydro			
Akosombo	Water	1,020	36.0
Bui	Water	400	14.1
Kpong	Water	160	5.7
Sub-Total		**1,580**	**55.8**
Thermal			
Takoradi Power Company (TAPCO)	LCO/Natural Gas	330	11.7
Takoradi International Company (TICO)	LCO/Natural Gas	220	7.8
Sunon Asogli Power (Ghana) Limited (SAPP) – IPP	Natural Gas	200	7.1
Cenit Energy Ltd (CEL) – IPP	LCO	126	4.5
Tema Thermal 1 Power Plant (TT1PP)	LCO/Natural Gas	110	3.9
Tema Thermal 2 Power Plant (TT2PP)	DFO/Natural Gas	50	1.8
Takoradi T3	LCO/Natural Gas	132	4.7
Mines Reserve Plant (MRP)	DFO/Natural Gas	80	2.8
Sub-Total		**1,248**	**44.1**
Renewables			
VRA Solar	**Solar**	2.5	0.1
Sub-Total		**2.5**	**0.1**
Total		**2,831**	**100**

Source: Ghana Energy Statistics, 2015

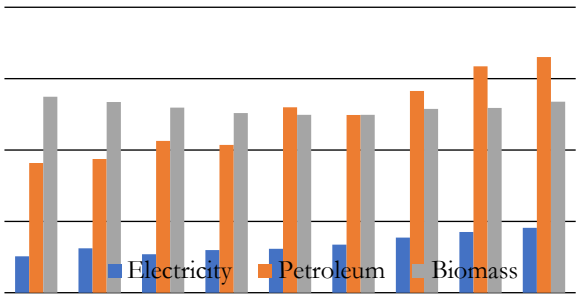
Renewable energy in Ghana is defined broadly to include solar, biomass, wind, hydro and tidal sources (Energy Commission 2006, p. 8). However, in this work, the term is used narrowly to cover solar, mini hydro, wind and biomass sources (National Energy Policy 2010). Apart from solar energy which is utilised heavily in its natural direct form and, to a lesser degree, through solar panels and other solar-related equipment, the country's range of renewable energy sources remain largely underexploited. Solar generation, for example, contributed only 0.1 percent of the total generation in 2015 (VRA 2016). But, there are indications that solar power generation and use are currently being promoted – in 2015, a total of 272 solar systems were installed in public facilities (National Budget and Economic Policy Statement 2016, p. 15). There are also efforts to promote residential use of solar energy in Ghana through the Rooftop Solar Photovoltaic (PV) Programme and the Capital Subsidy Scheme. Under this programme, 20,000 solar PV systems are to be installed on residential facilities across the country (Energy Commission 2016). Figures 1 and 2 provide an overview of energy supply and consumption in Ghana between 2005 and 2014.

Figure 1: Trend in Primary energy supply (ktoe)



Source: Based on figures from the Energy Statistics 2015

Figure 2: Trend in Final Energy Consumed (ktoe)



Source: Based on figures from the Energy Statistics 2015

Increasing demand for energy, especially electricity, has created an energy supply deficit. This crisis has persisted for more than a decade. Regular electricity imports from neighbouring countries such as Cote D'Ivoire and Burkina Faso to supplement power generated domestically at peak periods have not met required demands.

Energy policy conception of Ghana

Ghana has implemented a number of policies relevant to the energy sector with the aim of ensuring that adequate, reliable and quality energy is available to users. The main policies for the energy sector (power and petroleum) are the Strategic National Energy Plan (SNEP) and the National Energy Policy (NEP).

In 2001, the Ministry of Energy developed an Energy Sector Policy Framework document. The aim of this document was to provide a solid basis for future developments in the Energy sector. This document was subsequently revised into the SNEP in 2006. The SNEP presents an outlook of energy in Ghana for the period 2006-2020[4] based on the economic growth rates forecasted in the Ghana Poverty Reduction Strategy II[5]. The plan reviews the available energy sources and resources in Ghana and the ways to exploit them in order to ensure secured and adequate energy supply to support sustainable economic growth for both the present and the future. The vision of the energy sector, as captured in the SNEP, is to turn Ghana into an "energy economy" that ensures the production and distribution of high-quality energy services to all sectors of the economy in a sustainable manner, without compromising the environment. The objective to accelerate the development and utilization of renewable energy is complemented by a strategy targeting a 10 percent renewable energy share in Ghana's energy mix by 2020. Under the SNEP, a policy decision was made to allow private sector participation in the energy generation and supply. The SNEP had both demand and supply components focusing on key consumption sectors[6] and energy supply sources[7], respectively. The latter component contains individual source-specific plans to help achieve the main goals of the SNEP. Under the plan, total energy expenditure is expected to rise from about US$4.3-4.6 billion, 13-14 percent of GDP in 2015 to US$5.2 – 5.6 billion, 8-9 percent of GDP in 2020. Initial targets in the plans have not yet been achieved.

The NEP[8] essentially builds on the ideas in the SNEP. It retains the country's vision of becoming an "Energy Economy". The main goal of NEP is to 'make energy services universally accessible and readily available in an environmentally sustainable manner' (p. 8). To achieve these goals, ten specific objectives were set which include securing long-term fuel supply for the thermal plants in operation, modernising and expanding energy infrastructure, increasing access to modern forms of energy and promoting private participation in the energy sector (NEP 2010, pp. 8-9). The NEP divides the energy sector into three main sub-sectors, namely power, petroleum and renewable sources. Under the policy document each sub-sector has a specific goal and policy direction. For the power sub-sector, the goal is to 'become a major exporter of power in the sub-region by 2015' (NEP 2010, p. 11). To achieve this goal, it is expected that generation capacity will increase whilst transmission and distribution infrastructure is improved through public and private sector investments. The renewable energy sub-sector has a two-prong goal, namely to increase the share of renewable energy in the energy mix and to help mitigate the deleterious aspects of climate change. There are specific policy directions on biomass, wind and solar, mini-hydro and waste –to energy conversion.

On the petroleum sub-sector, the goal is 'to sustain and optimise the exploitation and utilisation of Ghana's oil and gas endowment for the overall benefit and welfare of all

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[4]The SNEP period covers two decades for a number of reasons, including the need for policy continuity. For the other reasons, see Energy Commission (2006) Strategic National Energy Plan (2006-2020)–Main Report, p.17. Available via: http://www.energycom.gov.gh/files/snep/MAIN%20REPORT%20final%20PD.pdf. Accessed 4 Mar 2016

[5]This is a national economic policy document.

[6] These sectors include industry and transportation, commercial and services, agriculture and fisheries and residential users.

[7] These sources are electricity, petroleum, wood fuels and renewables.

[8] Formulated in 2010. Available via: http://www.mofep.gov.gh/sites/default/files/pbb/ENERGY%20POLICY-%20February%2013,%202010%20FINAL.pdf.

Ghanaians, present and future' (NEP 2010, p. 16). Ghana's petroleum sector is segmented into the upstream, midstream and downstream sectors. The upstream activities include exploration and production of petroleum. The midstream activities include transportation of petroleum. The downstream activities include refining of petroleum by the country's only petroleum refinery, Tema Oil Refinery (TOR), the marketing and distribution of petroleum products by Oil Marketing Companies (OMCs) and the pre-mixing of petroleum product for other industrial uses. Policy direction under this sub-sector is, thus, divided into upstream, midstream, and downstream. There are elaborate policy positions on the upstream and midstream component. These include development and management of hydrocarbons, strengthening the investment regulatory framework for the sector and developing local content, participation and capacity building in the sub-sector (NEP 2010, p. 17). There are also directions on oil revenue management. The downstream component of the policy focuses primarily on expanding the infrastructure for the supply of petroleum products and enhancing access.

In 2009, the need for a standalone policy on the petroleum sub-sector became apparent with the production of oil well underway in Ghana. Another policy, the Fundamental Petroleum Policy of Ghana (FPPG), was formulated specifically for this sub-sector. The main goal of this policy is to transform the country into a net exporter of oil and gas. The FPPG addresses fundamental questions on resource ownership and jurisdiction, fiscal and legal framework, relationships among actors in the petroleum sector and sectoral institutional frameworks. The policy also provides direction on principles of national participation, with clear emphasis on the monitoring of operations of petroleum companies. This policy broadly sketches the government's oil policy, essentially committing it to pursuing sound management strategies that guarantee, amongst others, optimal extraction, minimal environmental and social disruption and local development (Cavnar 2008). The Policy serves as a "permanent guideline for governmental monitoring of the petroleum industry".[9] The NEP and FPPG have been implemented for the past five years and there are clear indications that some aspects of these policies have culminated in institutional and regulatory reforms in the energy sector. For example in 2011, the Renewable Energy Act[10] was enacted to provide for the development, management, utilization, sustainability and adequate supply of renewable energy.[11]

Institutional and Regulatory Framework

Ghana's energy sector is classified into two main sub-sectors: power and petroleum. The Government, through the Ministry of Energy, oversees the entire sector. The Ministry formulates energy policies; oversees implementation by bodies working under it; monitors and evaluates policies.

Power Sub-Sector

Hydro-electricity and thermal energy are the main sources of power under this sub-sector. The generation, transmission and distribution of power from these sources are under the control of five main state-owned entities.[12] The Volta River Authority (VRA) and the Bui Power Authority (BPA) are mainly responsible for hydro-power generation, with the former overseeing generation activities at the Akosombo and Kpong hydro-electric dams, whilst the latter is responsible for the 400 MW hydro-electric dam located at Bui, on the boundary between Brong-Ahafo and the Northern regions of Ghana. Additionally, VRA is also responsible for some thermal plants located at different parts of the country. In recent times, some limited share of power generation, especially from thermal sources, has come from independent power producers (IPPs).

[9] Draft Fundamental Petroleum Policy of Ghana 2009, s. 3.1

[10] Renewable Energy Act , 2011 (Act 832)

[11] Renewable Energy Act 2011 (Act 832), s. 1.

[12] Namely, the Volta River Authority, the Bui Power Authority and the Ghana Grid Company. The others are the Electricity Company of Ghana and the Northern Electricity Distribution Company.

Until 2006, VRA's functions covered transmission and distribution activities as well. Pursuant to the Energy Commission Act, 1997 (Act 541) (EC Act) and the Volta River Development (Amendment) Act, 2005 (Act 692), the Ghana Grid Company (GRIDCo) was incorporated in 2006 as a wholly-owned state company with exclusive responsibility for the operation of the National Interconnected Transmission system. Following the completion of an unbundling exercise involving GRIDCo and VRA in 2008, the transmission function was passed on to GRIDCo. GRIDCo's roles include bulk power purchase of electricity from generators (both national generator and IPPs), and sale to distributors and bulk customers. Power producers expecting to be connected to the transmission system must enter into an electrical connection agreement with GRIDCo.

The Electricity Company of Ghana (ECG) and the Northern Electricity Distribution Company (NEDCo)[13] are responsible for distributing electricity to the Southern part of the country[14] and the Northern regions respectively. With its large distribution network, ECG functions as an off-taker and guarantees the purchase of generated power by IPPs.

The Power sub-sector has two key regulating bodies, namely, the Public Utilities Regulatory Commission (PURC)[15] and the Energy Commission[16]. The PURC has oversight responsibility for the provision of utility services by public utilities including those in the power sub-sector. It plays key roles in economic regulation, quality assurance, promotion of competition among utility providers and price regulation. The Energy Commission, the other regulator, is responsible for granting licenses to power generators, transmitters and suppliers.[17] The core object of the Commission is 'to regulate and manage the utilisation of energy resources in Ghana and co-ordinate policies in relation to them'.[18]

There are several laws and regulations which collectively comprise the regulatory framework for the power sub-sector. Some of these laws set up the relevant institutions and their roles in the sector, while others provide detail information on regulatory issues such as licensing and standard setting. For instance, the Volta River Development Act, 1961 (Act 46) (as amended)[19] and the Bui Power Authority Act 2007 (Act 740) established the main hydro-power generating entities and their respective roles. The Renewable Energy Act, 2011 (Act 832) provides for the development, management and utilisation of renewable energy sources. The EC Act and the Public Utility Regulatory Commission Act, 1997 (Act 538) set out the laws relating to the technical and economic regulation of the power sector, respectively.[20] The Environmental Protection Agency Act, 1994 (Act 494) requires that projects in the power-sector receive environmental clearance from the agency. Apart from these laws, there are investment- related laws such as the Ghana Investment Promotion Centre Act, 2013 (Act 865) and the Free Zones Act, 1995 (Act 504) (as amended) which provide investment incentives to entities who wish to participate in the sector. There are laws on incorporation of companies such as the Companies Code, 1963 (Act 179) and the Incorporated Private Partnership Act, 1962 (Act 152) which entities seeking to register their companies to participate in the sector will need to be aware of.

The current regulatory framework has liberalised generation and distribution of power thereby making it possible for IPPs and distributors to participate in the process together with the established state-owned entities. Entities seeking to participate in this sector must meet the citizenship criterion (for individuals) or be incorporated under the laws of Ghana (for corporate

[13]Previously known as the Northern Electricity Department, a subsidiary of the VRA.
[14] Ashanti, Central, Eastern, Greater Accra, Volta and Western Regions
[15] Established under the Public Utilities Regulation Act, 1997 (Act 538)
[16] Established under the Energy Commission Act, 1997 (Act 541)
[17]It plays a similar role in the petroleum sector in the areas of refining, storage, bulk distribution, sale and marketing –see the Energy Commission Act, 1997 (Act 541)
[18]Energy Commission Act, 1997 (Act 541), s.1(2)
[19]Amended by the Volta River Development (Amendment) Act 2005 (Act 692).
[20]Beyond these legislations, there are subordinate legislation such as the Electricity Transmission (Technical, Operational and Standards of Performance) Rules, 2008 (L.I.1934) and the Electricity Regulations, 2008 (L.I. 1937)

entities).[21] The licensing regime does not exclude the state-owned entities.[22] For instance, the EC Act allows relevant state-owned utility companies to apply for and be granted licence for transmission or wholesale supply of electricity and gas to distribution companies and "bulk customers".[23]

The participation of foreign entities in the sector is also permitted. Those intending to take advantage of this window will need to be aware of the constitutional provision - Article 181 (5) - which requires that any international business or economic transaction to which the State is a party requires parliamentary approval before it can become effective. This applies to power purchase agreements as well, as highlighted in the recent Supreme court cases of ***A-G v Faroe Atlantic Company Limited*** (the Faroe Atlantic Case)[24] and ***A-G v Balkan Energy (Ghana) Limited & Ors*** (the Balkan Energy Case).[25]

Petroleum Sub-Sector: Institutional and regulatory framework

There are five key institutions involved in the regulation of the petroleum sector. The Ministry of Energy has the overall oversight responsibility for the sector. It is assisted in this role by the Petroleum Commission,[26] which focuses on the upstream sector, the National Petroleum Authority (NPA),[27] for the downstream sector and the Ghana National Petroleum Corporation (GNPC) which has pioneered oil exploration in Ghana for several decades and is currently involved in the upstream sector as a statutory commercial venture. Then there is the Environmental Protection Agency (EPA)[28] which functions cut across all sectors.

The Petroleum Commission's functions include issuing licences to operators and prospective operators, managing the use of petroleum resources and co-ordinating policies that relate to these functions. The NPA's main function is to ensure efficiency, growth and stakeholder satisfaction in the sector through regulation and monitoring. For instance, it monitors and regulates petroleum prices in accordance with the prescribed pricing formula and grants licenses to service providers and marketing companies engaged in a business or commercial activity in this downstream arena. The EPA is empowered to manage, control and monitor compliance of environmental regulations within the petroleum industry.

The GNPC[29] is vested with exclusive power to intervene in the upstream sector as a "commercial venture" and 'undertake the exploration, development, production and disposal of petroleum'.[30] No person, company or entity can engage in the exploration, development or production of petroleum without signing a petroleum agreement with GNPC and the Government of Ghana to that effect. The practice in Ghana is that, Petroleum Sharing Agreements (PSA) are used. However, since petroleum, like any other mineral in its natural state in or upon land or water in Ghana, is the property of the Republic and vested in the President on behalf of the people,[31] any transaction which involves the granting of rights for the exploitation of petroleum requires Parliamentary ratification.[32]

The Ministry of Finance, with the approval of Parliament, has the responsibility of setting the applicable levels of taxes, charges, duties or levies in order to achieve revenue targets for the national budget. The margins for the distribution companies are fixed annually through negotiations with the companies and are usually higher for kerosene because it is consumed in remote rural areas. (ESMAP 2006)

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[21]Energy Commission Act, 1997, s.12
[22]Except those expressly exempted like the VRA
[23]Energy Commission Act, 10997 (Act 541), ss.23-25
[24][2005-2006] SCGLR 271
[25] [2012] 2 SCGLR 998
[26] Established under the Petroleum Commission Act, 2011 (Act 821)
[27] Established by the National Petroleum Authority Act 2005 (Act 691)
[28] Environmental Protection Agency Act, 1994 (Act 490)
[29] GNPC is akin to a National Oil Company (NOC).
[30] Petroleum (Exploration and Production) Law, 1984 (PNDCL 84), s. 2(1)
[31] The Constitution of the Republic of Ghana 1992, article 237 (6)
[32]The Constitution of the Republic of Ghana 1992, article 268

International aspects

Ghana, although not a member of the Organisation for Economic Co-operation and Development (OECD), joined the OECD Development Centre on 6th October, 2015. This Centre 'helps decision makers find policy solutions to stimulate growth and improve living conditions in developing and emerging economies'(OECD 2015). Ghana is also a member of the Economic Community of West African States (ECOWAS) which promotes regional energy cooperation and integration. In terms of the environment, Ghana is a signatory to the United Nations Framework and Kyoto Protocol. In 2003, the Government of Ghana formally committed itself to implementing the Extractive Industries Transparency Initiative (EITI). However, until 2013 Ghana was only a signatory for the mining sector and did not submit its audits for oil and gas to the EITI (Ministry of Finance 2014).

Concluding statements

There are varied challenges with the energy sector in Ghana. Most of these are catalogued in the various policy documents. In recent times, Ghana has experienced persistent, irregular and unpredictable power outages. Although the country experienced similar power outages in 1983, 1994, 1997-98 and 2006-07, none was as intense as the current situation. This energy crisis threatens not only GDP growth, but also public safety. The crisis has been attributed to over-dependence on hydropower facilities which are now plagued with low water levels.[33] The Government in attempts to solve this problem is attracting more private sector participation into the sector through IPPs who have begun to enter the electricity generation market previously dominated by the public sector. However, the industry is still beset with uncompetitive tariffs and the absence of credible off-takers. It is expected that with strong demand, a clear regulatory environment, credible market pricing and a viable off-taker, the public and private efforts to address the energy crisis will be successful.

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